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EXAMINER

ANDERSON, DENISE R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,350	Applicant(s) JACKSON ET AL.	
	Examiner Denise R. Anderson	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36,38-44,48-97 and 99-111 is/are pending in the application.
- 4a) Of the above claim(s) 1-18,33-35,52-60,64-97 and 99-111 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-32,36,38-44,48-51 and 61-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-36,38-44,48-97 and 99-111 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/19/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

2. Claim 26 was amended to address an informality. The previous objection is withdrawn.

3. Claims 31 was amended from dependent claim form to multiple dependent claim form. Accordingly, claims 31 and 32 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim (claim 31) cannot depend from any other multiple dependent claim (claim 24). See MPEP § 608.01(n). In the patentability analysis below, claims 31 and 32 have been addressed on the merits as if they were not amended.

4. Claim 40 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

5. Regarding claim 40, the material or article worked upon does not limit the claim. As stated in MPEP 2115 [R-2], “‘Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim.’ *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, ‘[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.’ *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).” Claim 40 recites that the cleaning liquid is liquid filtered by the filter and, as such, does not limit claim 19.

Table 1 Keys Claimed Structure To Hansen et al. As Primary Reference

6. Table 1 below keys the claimed apparatus structure, with specification support, to that of the prior art. Hansen et al. (U.S. Patent No. 6,214,214 B1, Apr. 10, 2001) is the primary reference.

7. Hansen et al. discloses a filtration system with a “treatment tank [that] may form part of a water softener, deionization unit or a mechanical filter.” Hansen et al., Abstract, line 1 and col. 2, lines 13-15. In Fig. 1, Hansen et al. further teaches that the filtration system has a valve subsystem (control valve assembly 14) connected to a controller that “controls the regeneration of an exhausted tank . . . operative to provide a final rinse in the service direction” just after “the counter-flow rinse step.” Hansen et al., Abstract, line 1, 5, and 7-10 and col. 8, lines 40-41. In other words, the rinses are part of the recited purging cycle [withdrawn method claims 10, 27, 28, and 77; apparatus claim 43]. The service direction refers to the flow direction during the filtration cycle [withdrawn claims 10, 31, 32, and 77; apparatus claim 41]. Regarding the rinses, Hansen et al. discloses, “This is accomplished by a purge valve (part of the recited valve subsystem) . . . [that] is responsive to fluid signals applied to an inlet valve (the valve on the recited inlet system) and an outlet valve (the valve on the recited discharge outlet) associated with the tank being regenerated. More specifically, the fluid signals that close the outlet valve and open the inlet valve, are utilized to cause the opening of the purge valve in order to communicate the tank outlet (the recited discharge outlet) with the drain (as shown in applicant’s Fig. 8 purging mode).” Hansen et al., Abstract, lines 7-10 and 12-18.

8. Regarding the recited filter cleaning apparatus, Hansen et al. discloses, “The system controller also includes an improved regeneration control turbine (part of applicant’s filter

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cleaning apparatus) which includes a plurality of vanes extending from a hub and positioned between disc-like members that overlie the edges of the vanes in order to create cavities for receiving fluid emitted by a regeneration control nozzle.” Hansen et al., Abstract, lines 19-24. Regarding Figs. 1 and 2, Hansen et al. continues, “The turbine 142 is mechanically coupled to the regeneration disk 120 so that rotation of the turbine effects rotation of the control disk.” Hansen et al., col. 5, lines 26-29. Regarding Fig. 2, Hansen et al. further teaches, “The ports and regeneration control disk 120 are arranged so that as the regeneration wheel 120 rotates, the valves are sequentially operated in order to cycle the exhausted tank through a regeneration cycle.” Hansen et al., col. 4, lines 49-53. This is part of the recited filter cleaning apparatus used in the purging mode (regeneration cycle). As shown in Figs. 1-3, particularly Fig. 3, the Hansen et al. filter cleaning apparatus has a rotatable member (turbine 142) mounted on a tubular member (center of turbine 142) with at least one side-opening (nozzle 141) to supply cleaning liquid (fluid) to the rotatable member (turbine 142). As such, Hansen et al. discloses the claimed invention, but teaches projecting cleaning liquid on to rotatable member to clean the filter, instead of projecting cleaning liquid on to the downstream side of the filter to clean the filter, as recited.

9. Table 1 below keys the claimed apparatus structure, with specification support, to that of the prior art. In the following sections, the claims appear in *italics* with the keyed structure underlined. The patentability analysis is interspersed amongst the claims and appears in normal font.

Table 1: Claimed structure keyed to that of the prior art.	
<i>Claimed structure.</i>	<i>Prior art – Hansen et al. is primary reference.</i>
<p><i>Filtration system</i> – Fig. 10, filtration system 1.</p> <p><i>Vessel</i> – Figs. 7 and 8, outside periphery of outer chamber 5. Also referred to as housing 2 in specification.</p> <p><i>Filter</i> – Figs. 7 and 8, filter inside of vessel.</p> <p><i>First chamber</i> – Figs. 7 and 8, chamber within vessel.</p> <p><i>Discharge outlet</i> – Fig. 7, discharge outlet 11.</p> <p><i>System inlet</i> – Figs. 7 and 8, system inlet port 18.</p>	<p><i>Filtration system</i> – Fig. 1, water treatment system.</p> <p><i>Vessel</i> – Fig. 1, tanks 10 and 12.</p> <p><i>Filter</i> – “The tank defines a fluid flow path through which water to be treated is passed. The treatment tank may form part of a water softener, deionization unit or a mechanical filter.” Hansen et al., col. 2, lines 12-15.</p> <p><i>First chamber</i> – Fig. 1, chambers within tanks 10 and 12.</p> <p><i>Discharge outlet</i> – Fig. 1, “tank outlet passages 104, 106 of tanks 10, 12, respectively.” Hansen et al., col. 4, lines 11-12.</p> <p><i>System inlet</i> – Fig. 1, “source of water to be treated” 16. Hansen et al., col. 3, lines 47-48.</p>
<i>Pump</i> – Figs. 7 and 8, pump 15.	<i>Pump</i> – Source of water to be treated provides pressure differential across filter. Source of regeneration solution provides pressure differential across the filter.
<i>Venturi</i> – Figs. 7 and 8, venturi 71.	<i>Venturi</i> – Fig. 1, venturi 260a.
<i>Valve sub-system</i> – Figs. 7 and 8, change-over valve system 7.	<i>Valve sub-system</i> – Fig. 1, control valve assembly 14.
<i>UV light module</i> – Figs. 7 and 8, ultraviolet light module 14.	<i>UV light module</i> – Reid, Figs. 1-4.
<p><i>Filter cleaning apparatus</i> – Figs. 7 and 8, shown with <i>rotatable member</i> 25 with openings, tubular member, and closure member where, “The rotatable member is preferably rotatably mounted on a <i>tubular member</i> having at least one side-opening in liquid communication with an interior of the rotatable member.” Specification, ¶ 45, lines 6-9. The tubular member is not referenced in the drawings.</p> <p><i>Flow compensating device</i> – Figs. 7 and 8, valve that changes flow rate to filter cleaning apparatus.</p>	<p><i>Filter cleaning apparatus</i> – As shown in Figs. 1-3, particularly Fig. 3, the Hansen et al. filter cleaning apparatus has a <i>rotatable member</i> (turbine 142) mounted on a <i>tubular member</i> (center of turbine 142) with at least one side-opening (nozzle 141) to supply cleaning liquid (fluid) to the rotatable member (turbine 142). As such, Hansen et al. discloses the claimed invention, but teaches projecting cleaning liquid on to rotatable member to clean the filter, instead of projecting cleaning liquid on to the downstream side of the filter to clean the filter.</p> <p>In Figs. 1 and 10, Racine teaches the recited filter cleaning apparatus in the form of piston 48. As shown in Fig. 10, Racine teaches that the filter cleaning apparatus has a <i>rotatable member</i> (main body 66) mounted to a <i>tubular member</i> (plunger 72).</p> <p><i>Flow compensating device</i> – Fig. 1, fluid flow regulating element 264 in conjunction with drain valves 130 and 132. Hansen et al., col. 5, lines 48-51, lines 8-11, and lines 40-47. This provides a controlled flow of water from collection chamber 110 into the filter cleaning apparatus,</p>
<i>Pressure relief valve</i> – Figs. 5, 7, and 8, pressure relief valve 59.	<i>Pressure relief valve</i> – Magorien et al., figure with pressure relief valve 99 to control partial pressure at venturi 17 using flow rate of pump 19, downstream from filter 25.

Claim Rejections - 35 USC § 103
Filtration System Recited in Claim 19-32, 36, 38-44, 48-51, and 61-63

10. Claims 19, 20, 38-40, and 48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (U.S. Patent No. 6,214,214 B1, Apr. 10, 2001), in view of Racine (U.S. Patent No. 6,443,312, Sep. 3, 2002) for the particulars of the filter cleaning apparatus.

11. Claims 19 and 20 follow, with the underlined structure keyed to that of the prior art in Table 1 above.

Claim 19. (Currently Amended) A filtration system for filtering particulates from a liquid, the (filtration) system comprising

a sealed vessel suitable for supporting a pressure less than atmospheric pressure, and a filter for filtering particulates from said liquid, the filtration system further comprising

a filter cleaning apparatus configured to project a cleaning liquid supplied by a separate dedicated pump onto a downstream side of the filter to dislodge particulates trapped on an upstream side thereof,

the filter cleaning apparatus comprising a rotatable member rotatably mounted on a tubular member having at least one side-opening configured to supply cleaning liquid to said rotatable member, wherein a gap is provided between the tubular member and the rotatable member configured to allow cleaning fluid to escape and maintain the bearing surfaces free of particulates.

Claim 20. (Original) A filtration system as claimed in claim 19, wherein a first chamber is defined in the sealed vessel and the filter is provided in said first chamber.

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12. As shown in Table 1, Hansen et al. discloses a filtration system in a vessel with a filter provided in a chamber [claims 19 and 20]. Hansen et al. further teaches a filtration system with a “treatment tank [that] may form part of a water softener, deionization unit or a mechanical filter.” Hansen et al., Abstract, line 1 and col. 2, lines 13-15. As such, Hansen et al. discloses a filtration system in a sealed vessel suitable for supporting a pressure less than atmospheric [claim 19].

The filter is a mechanical filter that filters particulates from a liquid [claim 19].

13. As shown in Table 1 above, Hansen et al. discloses the claimed invention including a fluid cleaning apparatus shown in Figs. 1-3 that has a purge valve used to clean the filter. The purge valve has a rotatable member (turbine 142) mounted on a tubular member (center of turbine 142) with at least one side-opening (nozzle 141) to supply cleaning liquid (fluid) to the rotatable member (turbine 142). Regarding the separate dedicated pump for the cleaning liquid, Hansen et al. teaches this as part of the source of regeneration solution 15, shown in Fig. 1.

14. To recap, Hansen et al. discloses the claimed invention, but teaches projecting cleaning liquid on to rotatable member to clean the filter, instead of projecting cleaning liquid on to the downstream side of the filter to clean the filter. In Figs. 1 and 10, Racine teaches the recited filter cleaning apparatus in the form of piston 48. Racine further teaches that the filter cleaning apparatus provides a “self-cleaning filter . . . for filtering incoming dirty liquid and distinctly recuperating clean liquid and waste liquid.” Racine, Abstract, lines 1-3. Specifically, in Fig. 10, Racine teaches that the filter cleaning apparatus has a rotatable member (main body 66) mounted to a tubular member (plunger 72). There is at least one side-opening to supply cleaning liquid to the rotatable member (main body 66) as indicated by the flow lines. There is a gap between the tubular member (at rod 72c of plunger 72) and the rotatable member (main body 66). The gap

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allows cleaning fluid to escape and maintain the bearing surfaces free of particulates, as indicated by the flow lines.

15. Claims 48-51 recite further limitations on the filter cleaning apparatus which Racine discloses. Claims 48-51 follow.

Claim 48. (Original) A filtration system as claimed in claim 19 further comprising the (filter cleaning apparatus having) a closure member for closing an end of the tubular member and for re-directing liquid introduced into the tubular member through the at least one side-opening.

Claim 49. (Original) A filtration system as claimed in claim 48, wherein the closure member is generally frusto-conical in shape.

Claim 50. (Currently Amended) A filtration system as claimed in claim 48, wherein the closure member is fixedly attached to the tubular member.

Claim 51. (Currently Amended) A filtration system as claimed in claim 48, wherein the closure member is integrally formed with the tubular member.

16. In Fig. 10, Racine discloses that the filter cleaning apparatus (piston 48) has a tubular member (plunger 72) with a closure member (conical seats 72a, 72b) for closing an end of the tubular member (plunger 72) and re-directing liquid introduced into the tubular member (plunger 72) through at least one side opening as indicated by the flow lines [claim 48]. The closure member (conical seats 72a, 72b) is generally frusto-conical in shape [claim 49] and fixedly attached to the tubular member (plunger 72) [claim 50] – but can also be integrally formed [claim 51] as shown in Fig. 12.

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17. To recap, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the Hansen et al. filtration system with the filter cleaning apparatus, as taught by Racine, since Racine states in the Abstract, lines 1-3, that such a modification would provide a “self-cleaning filter . . . for filtering incoming dirty liquid and distinctly recuperating clean liquid and waste liquid.”

18. Claims 38 and 39 recite further limitations on the flow compensating device which Hansen et al., in view of Racine, discloses. Claims 38 and 39 follow.

Claim 38. (Original) A filtration system as claimed in claim 19 further comprising a flow compensating device for increasing the proportion of the cleaning liquid directed to the filter cleaning apparatus when the filter is partially blocked.

Claim 39. (Original) A filtration system as claimed in claim 38, wherein the flow compensating device is a spring-loaded valve.

19. Regarding the flow compensating device, Hansen et al. discloses this in Fig. 1 as the fluid flow regulating element 264 that works in conjunction with spring-loaded drain valves 130 and 132. During the purging cycle, Hansen et al. teaches, “When either of the drain valves 130, 132 are opened (and the respective inlet and outlet valves are both closed), water in the collection chamber 110 is allowed to proceed through the venturi 260a and into the tank being regenerated.” Hansen et al., col. 5, lines 48-51 and col. 5, lines 8-11. Hansen et al. further teaches, “The regeneration components include a regeneration fluid aspirator 260 disposed in the collection chamber 110. The aspirator comprises a fluid flow regulating element 264 and a venturi 260a. The outlet of the venturi communicates with the tank outlet passages 104, 106 through branch passages 104a, 106a that include check valves 280, 282. The throat of the venturi communicates with the source of regeneration solution 15.” Hansen et al., col. 5, lines

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40-47. As such, this provides a controlled flow of water from collection chamber 110 into the filter cleaning apparatus with a fluid flow compensating device that has a spring-loaded valve, as recited in claims 38 and 39.

20. Claim 40 follows.

Claim 40. (Currently Amended) A filtration system as claimed in claim 19, wherein the cleaning liquid is liquid filtered by the filter.

21. Regarding claim 40, the material or article worked upon does not limit the claim. As stated in MPEP 2115 [R-2], “‘Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim.’ *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, ‘[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.’ *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).” Claim 40 recites that the cleaning liquid is liquid filtered by the filter and, as such, does not limit claim 19. Claim 40 depends on claim 19 and will be rejected accordingly.

22. In summary, Hansen et al., in view of Racine for the particulars of the filter cleaning apparatus, discloses or suggests all limitations recited in claim 19, 20, 38-40, and 48-51.

23. Claims 21-26 and 61-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (U.S. Patent No. 6,214,214 B1, Apr. 10, 2001), in view of Racine (U.S. Patent No. 6,443,312, Sep. 3, 2002) for the particulars of the filter cleaning apparatus, as applied to claim 19 above – in view of Magorien et al. (U.S. Patent No. 3,726,063, Apr. 10, 1973) for the pump configuration to control partial pressure downstream of the filter. The claims appear below in

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italics with Table 1's keyed structure underlined. The patentability analysis follows in normal font.

Claim 24. (Currently Amended) A filtration system as claimed in any one of claims 19 to 23 further comprising a pump suitable for reducing the pressure in said sealed vessel to cause liquid to be drawn into the vessel.

Claim 26. A filtration system as claimed in claim 23 further comprising a valve sub-system operable to change the connection of the pump to the sealed vessel.

The claims relating to the pressure relief valve:

Claim 61. (Currently Amended) A filtration system as claimed in claim 19 further comprising a pressure relief valve.

Claim 62. (Original) A filtration system as claimed in claim 61 wherein the pressure relief valve is operable to prevent the pressure in the sealed vessel falling below a predetermined level.

Claim 63. (Currently Amended) A filtration system as claimed in claim 61 further comprising a pump suitable for reducing the pressure in said sealed vessel to cause liquid to be drawn into the vessel, wherein the pressure relief valve is operable to place an outlet of the pump in communication with an inlet of the pump when the pressure in the sealed vessel falls below said predetermined level.

The claims relating to the venturi:

Claim 21. (Currently Amended) A filtration system as claimed in claim 19 further comprising air evacuation means (a venturi) suitable for evacuating air from the (filtration) system.

Claim 22. (Original) A filtration system as claimed in claim 21, wherein the air evacuation means (venturi) is arranged to evacuate air from the sealed vessel.

Claim 23. (Currently Amended) A filtration system as claimed in claim 21, wherein the air evacuation means is a venturi.

Claim 25. (Currently Amended) A filtration system as claimed in claims 23 wherein the venturi is connected on the pressure side of the pump.

24. As shown in Table 1 above, Hansen et al. discloses the claimed invention, including the valve sub-system (control valve assembly 14) to change the connection of a pump sending fluid through supply conduit 220 in Fig. 1, as recited in claim 26. Hansen et al. does not teach the pump configuration to control partial pressure downstream of the filter.

25. In the figure, Magorien et al. teaches controlling the partial pressure downstream of filter 25 using a venturi (or aspirator) 17 on the output side of pump 19 – with pump 19 set up to control partial pressure using a pressure relief valve 99 on a bypass line, i.e. the recited “outlet of the pump in communication with an inlet of the pump.” The Magorien et al. pump configuration, with its venturi, is set up to “remove contaminants such as dissolved and entrained gas, water and solids from fluid” in a sealed vessel (holding tank 16 and decontamination tank 34) since “it is . . . known to remove dissolved and entrained gas by subjecting the contaminated fluid to a vacuum.” Magorien et al., Abstract, lines 1-2 and col. 1, line 67 to col. 2, line 2. As such, Magorien et al. discloses a venturi arranged to evacuate air from a sealed vessel [claim 27].

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Regarding the pump configuration, Magorien et al. further teaches that such a setup is “a well known device” and that “[t]he less-than-atmospheric pressure induced in line 24 by the aspirator immediately begins to draw fluid from container 10 through filter 25.” Magorien et al., col. 2, lines 48-52 and col. 3, lines 38-41.

26. To recap, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have constructed the Hansen et al. filtration system with the pump configuration to control partial pressure downstream of the filter, as taught by Magorien et al., since Magorien et al. states at col. 2, lines 48-52 and col. 3, lines 38-41, that such a modification is “a well known device” and that “[t]he less-than-atmospheric pressure induced in line 24 by the aspirator immediately begins to draw fluid from container 10 through filter 25.”

27. In summary, Hansen et al., in view of Magorien et al. for the pump configuration to control partial pressure downstream of the filter, discloses or suggests all limitations recited in claims 21-26 and 61-63.

28. Claims 26-32 and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (U.S. Patent No. 6,214,214 B1, Apr. 10, 2001), in view of Racine (U.S. Patent No. 6,443,312, Sep. 3, 2002) for the particulars of the filter cleaning apparatus, as applied to claim 19 above, in view of Magorien et al. (U.S. Patent No. 3,726,063, Apr. 10, 1973) for the pump configuration to control partial pressure downstream of the filter as applied to claim 24 above – in view of Baker (U.S. Patent No. 4,627,118, Dec. 9, 1986) to explicitly teach the valve-subsystem functional limitations are known in the art.

29. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (U.S. Patent No. 6,214,214 B1, Apr. 10, 2001), in view of Racine (U.S. Patent No. 6,443,312,

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Sep. 3, 2002) for the particulars of the filter cleaning apparatus, as applied to claim 19 above – in view of Baker (U.S. Patent No. 4,627,118, Dec. 9, 1986) to explicitly teach the valve-subsystem functional limitations are known in the art.

30. Claims 26-32 and 41-44 appear below in italics, with the claimed structure underlined. The patentability analysis follows in normal font. Because claim dependency is convoluted, claims 19-24 are also included in the claim listing.

Claim 19. (Currently Amended) A filtration system for filtering particulates from a liquid, the (filtration) system comprising

a sealed vessel suitable for supporting a pressure less than atmospheric pressure, and a filter for filtering particulates from said liquid, the filtration system further comprising

a filter cleaning apparatus configured to project a cleaning liquid supplied by a separate dedicated pump onto a downstream side of the filter to dislodge particulates trapped on an upstream side thereof,

the filter cleaning apparatus comprising a rotatable member rotatably mounted on a tubular member having at least one side-opening configured to supply cleaning liquid to said rotatable member, wherein a gap is provided between the tubular member and the rotatable member configured to allow cleaning fluid to escape and maintain the bearing surfaces free of particulates.

Claim 20. (Original) A filtration system as claimed in claim 19, wherein a first chamber is defined in the sealed vessel and the filter is provided in said first chamber.

Claim 21. (Original) A filtration system as claimed in claim 19 further comprising air evacuation means (a venturi) suitable for evacuating air from the (filtration) system.

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Claim 22. (Original) A filtration system as claimed in claim 21, wherein the air evacuation means (venturi) is arranged to evacuate air from the sealed vessel.

Claim 23. (Original) A filtration system as claimed in claim 21, wherein the air evacuation means is a venturi.

Claim 24. (Original) A filtration system as claimed in any one of claims 19 to 23 further comprising a pump suitable for reducing the pressure in said sealed vessel to cause liquid to be drawn into the vessel.

Claim 44. (Currently Amended) A filtration system as claimed in claim 19 further comprising a pump suitable for reducing the pressure in said sealed vessel to cause liquid to be drawn into the vessel, wherein the cleaning liquid is supplied to the filter cleaning apparatus by the pump.

The claims relating to valve-subsystem functional limitations:

Claim 26 (Currently Amended). A filtration system as claimed in claim 24 further comprising a valve sub-system operable to change the connection of the pump to the sealed vessel.

Claim 27. (Original) A filtration system as claimed in claim 26, wherein the valve sub-system is operable to connect the pump upstream of the sealed vessel to cause the (filtration) system to operate in a purging mode.

Claim 31. (Currently Amended) A filtration system as claimed in claim 26, wherein the valve sub-system is operable to connect the pump downstream of the sealed vessel to cause the (filtration) system to operate in a filtration mode.

Claim 32. (Original) A filtration system as claimed in claim 31, wherein, when the (filtration) system is operating in the filtration mode, the pump draws the liquid supply into the (filtration) system through a system inlet, the system inlet being connected to at least one conduit having at least one opening.

Claim 28. (Original) A filtration system as claimed in claim 27, wherein, when the (filtration) system is operating in said purging mode, the pump introduces a purging liquid into the sealed vessel to flush filtered particulates through a discharge outlet.

Claim 29. (Original) A filtration system as claimed in claim 28, wherein the valve sub-system is operable to open and/or close the discharge outlet.

Claim 30. (Original) A filtration system as claimed in claim 28, wherein the purging liquid is liquid taken from upstream of the filter.

Claim 41. (Currently Amended) A filtration system as claimed in claim 26, wherein the valve sub-system is operable to connect the pump downstream of the sealed vessel to cause the (filtration) system to operate in a filtration mode and the cleaning liquid is supplied to the filter cleaning apparatus only when the (filtration) system is operating in a filtration mode.

Claim 42. (Original) A filtration system as claimed in claim 41, wherein the supply of cleaning liquid is controlled by the valve-subsystem.

Claim 43. (Currently Amended) A filtration system as claimed in claim 26, wherein the valve sub-system is operable to connect the pump upstream of the sealed vessel to cause the (filtration) system to operate in a purging mode; when the (filtration) system is operating in said purging mode, the pump introduces a

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purging liquid into the sealed vessel to flush filtered particulates through a discharge outlet the purging liquid being introduced into the sealed vessel through said filter cleaning apparatus when the (filtration) system operates in said purging mode.

31. Table 2 below keys the limitations of claims 26-32 to those of claims 41-44.

Table 2: Limitations of claims 26-30 keyed to those of claims 41-44.	
Claims 26-30.	Claims 41-44.
<p><i>Claim 24. (Currently Amended) A <u>filtration system</u> as claimed in any one of claims 19 to 23 further comprising a <u>pump</u> suitable for reducing the pressure in said sealed <u>vessel</u> to cause liquid to be drawn into the <u>vessel</u>.</i></p>	<p><i>Claim 44. (Currently Amended) A <u>filtration system</u> as claimed in claim 19 further comprising a <u>pump</u> suitable for reducing the pressure in said sealed <u>vessel</u> to cause liquid to be drawn into the <u>vessel</u>, wherein the cleaning liquid is supplied to the <u>filter cleaning apparatus</u> by the <u>pump</u>.</i></p>
<p><i>Filtration mode functional limitations.</i></p> <p><i>Claim 26. A <u>filtration system</u> as claimed in claim 24 further comprising a <u>valve sub-system</u> operable to change the connection of the <u>pump</u> to the sealed <u>vessel</u>.</i></p> <p><i>Claim 31. (Currently Amended) A <u>filtration system</u> as claimed in claim 26, wherein the <u>valve sub-system</u> is operable to connect the <u>pump</u> downstream of the sealed <u>vessel</u> to cause the <u>(filtration) system</u> to operate in a filtration mode.</i></p> <p><i>Claim 32. (Original) A <u>filtration system</u> as claimed in claim 31, wherein, when the <u>(filtration) system</u> is operating in the filtration mode, the <u>pump</u> draws the liquid supply into the <u>(filtration) system</u> through a <u>system inlet</u>, the <u>system inlet</u> being connected to at least one conduit having at least one opening.</i></p>	<p><i>Filtration mode functional limitations</i></p> <p><i>Claim 41. (Currently Amended) A <u>filtration system</u> as claimed in claim 26, wherein the <u>valve sub-system</u> is operable to connect the <u>pump</u> downstream of the sealed <u>vessel</u> to cause the <u>(filtration) system</u> to operate in a filtration mode and the cleaning liquid is supplied to the <u>filter cleaning apparatus</u> only when the <u>(filtration) system</u> is operating in a filtration mode.</i></p> <p><i>Claim 42. (Original) A <u>filtration system</u> as claimed in claim 41, wherein the supply of cleaning liquid is controlled by the <u>valve-subsystem</u>.</i></p>
<p><i>Purging mode functional limitations.</i></p> <p><i>Claim 26. A <u>filtration system</u> as claimed in claim 24 further comprising a <u>valve sub-system</u> operable to change the connection of the <u>pump</u> to the sealed <u>vessel</u>.</i></p> <p><i>Claim 27. (Original) A <u>filtration system</u> as claimed in claim 26, wherein the <u>valve sub-system</u> is operable to connect the <u>pump</u> upstream of the sealed <u>vessel</u> to cause the <u>(filtration) system</u> to operate in a purging mode.</i></p> <p><i>Claim 28. (Original) A <u>filtration system</u> as claimed in claim 27, wherein, when the <u>(filtration) system</u> is operating in said purging mode, the <u>pump</u> introduces a purging liquid into the sealed <u>vessel</u> to flush filtered particulates through a <u>discharge outlet</u>.</i></p> <p><i>Claim 29. (Original) A <u>filtration system</u> as claimed in</i></p>	<p><i>Purging mode functional limitations.</i></p> <p><i>Claim 43. (Currently Amended) A <u>filtration system</u> as claimed in claim 26, wherein the <u>valve sub-system</u> is operable to connect the <u>pump</u> upstream of the sealed <u>vessel</u> to cause the <u>(filtration) system</u> to operate in a purging mode; when the <u>(filtration) system</u> is operating in said purging mode, the <u>pump</u> introduces a purging liquid into the sealed <u>vessel</u> to flush filtered particulates through a <u>discharge outlet</u> the purging liquid being introduced into the sealed <u>vessel</u> through said <u>filter cleaning apparatus</u> when the <u>(filtration) system</u> operates in said purging mode.</i></p>

<i>claim 28, wherein the <u>valve sub-system</u> is operable to open and/or close the <u>discharge outlet</u>.</i>	
<i>Claim 30. (Currently Amended) A <u>filtration system</u> as claimed in claim 28, wherein the purging liquid is liquid taken from upstream of the <u>filter</u>.</i>	

32. Hansen et al., in view of Racine and Magorien et al., discloses the claimed invention. As discussed above in paragraph 7, Hansen et al. further teaches the recited filtration mode and purging mode. Hansen et al. does not explicitly disclose all of the functional limitations of the apparatus recited in claims 26-32 and 41-44. Baker teaches these are known in the art in the context of a swimming pool, using only one pump and a valve system to provide both a filtration mode and a purging mode.

33. Specifically, in Figs. 3, 5, and 8, Baker discloses a filtration system with “a pump drawing a vacuum downstream of the filter bed and recirculating filtered water to the swimming pool.” Baker, Abstract, lines 18-20. The filtration system is in a sealed vessel (Figs. 3 and 5, filter tank 10; Fig. 8, filter tank 50) with a filter (Figs. 3 and 5, filter bed 8 with screen 35; Fig. 8 filter bed 77 with screen 75) [claim 19] and the pump causes liquid to be drawn into the sealed vessel [claims 24 and 44].

34. In Fig. 8, Baker discloses there is a valve subsystem that operates to change the connection of the pump [claims 26, 41, and 43] such that the pump is downstream of the sealed vessel during filtration mode (valves 66, 76, and 86 are open – while valves 78, 82, and 83 are closed) [claims 31 and 41] and the pump is upstream of the sealed vessel during purging mode (valves 82 and 83 are open – while valves 66, 76, 78, 86 are closed) [claim 27 and 43]. Baker, col. 15, lines 63 to col. 16, line 2; col. 17, lines 30-45. Similarly, in Fig. 5, Baker discloses a valve subsystem that operates to change the connection of the pump [claim 26, 41, and 43] such that the pump is downstream of the sealed vessel during filtration mode (valves 15, 16, and 27

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are open – while valves 28 and 41 are closed) [claims 31 and 41] and the pump is upstream of the sealed vessel during purging mode (valves 41 and 32 are open – while valves 15, 16, 27, and 28 are closed [claims 27 and 43]. Baker, col. 11, lines 63 to col. 12, line 3; col. 13, lines 32-49.

35. When the Baker filtration system is operating in filtration mode, the pump draws the liquid supply into the filtration system through a system inlet (Fig. 5, inlet line connection 1; Fig. 8, main drain line 52) [claims 32, 41, and 42]. When the Baker filtration system is operating in purging mode, the pump introduces purged liquid into the vessel to flush particulates through a discharge outlet (Fig. 5, outlet line 5; Fig. 8, backwash line 80) [claims 28 and 43], which is opened and closed by the valve subsystem (valve 82) [claim 29 and 43]. The purging liquid is taken upstream of the filter (Fig. 5, filter bed 8 and screen 35; Fig. 8, filter bed 77 and screen 75) [claim 30 and 43] from swimming pool P through drain D.

36. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have set up Hansen et al. filtration system to meet the functional limitations recited in claims 26-32 and 41-44 as taught by Baker, since Barker states in the Abstract, lines 18-20, that such a modification would provide a filtration system with “a pump drawing a vacuum downstream of the filter bed and recirculating filtered water to the swimming pool.” In other words, only one pump and a valve system is needed to run both a filtration mode and a purging mode.

37. In summary, Hansen et al., in view of Racine for the particulars of the filter cleaning apparatus, as applied to claim 19 above, in view of Magorien et al. for the pump configuration to control partial pressure downstream of the filter as applied to claim 24 above – in view of Baker to explicitly teach the valve-subsystem functional limitations are known in the art – discloses or suggests all limitations recited in claims 26-32 and 41-43.

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38. In summary, Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al., in view of Racine for the particulars of the filter cleaning apparatus, as applied to claim 19 above – in view of Baker to explicitly teach the valve-subsystem functional limitations are known in the art – discloses or suggests all claim 44 limitations.

39. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (U.S. Patent No. 6,214,214 B1, Apr. 10, 2001), in view of Racine (U.S. Patent No. 6,443,312, Sep. 3, 2002) for the particulars of the filter cleaning apparatus, as applied to claim 19 above, in view of Reid (U.S. Patent No. 3,923,663, Dec. 2, 1975) for the ultraviolet light module in post-treatment. The claim appears below in italics with Table 1's keyed structure underlined. The patentability analysis follows in normal font.

Claim 36. (Currently Amended) A filtration system as claimed in claim 19 further comprising a UV light module.

40. As shown in Table 1 above, Hansen et al., in view of Racine, discloses the claimed invention, but does not teach that there is a UV light module for post-treatment. In Figs. 1-4, Reid discloses, “A unitary device for purifying water and other fluids embodying an annular filter surrounding an elongate tube which in turn surrounds and cooperates with an elongate ultraviolet lamp to form a flow channel for fluid to be irradiated. Fluid passing through the filter is conveyed through the flow channel along the length of the lamp to effect sterilization.” It would have been obvious to one having ordinary skill in the art at the time the invention was made to have treated the water with a UV light module as taught by Reid, since Reid states in the Abstract, line 7, that such a modification would “effect sterilization.”

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41. In summary, Hansen et al., in view of Racine for the particulars of the filter cleaning apparatus – in view of Reid for the ultraviolet light module in post-treatment – discloses or suggests all claim 36 limitations.

Response to Arguments

42. Applicant's arguments filed June 11, 2010 have been fully considered but they are not persuasive.

43. Applicant's arguments are listed below, with the examiner's response after each argument.

- a. Regarding amended claim 19, applicant argues, "In contrast to the arrangement of Racine, the claimed invention recites that the filtration system comprises a filter cleaning apparatus configured to project a cleaning liquid supplied by a separate dedicated pump onto the filter. The filter cleaning apparatus is in the form of a rotatable member mounted on a tubular member having at least one side-opening configured to supply cleaning liquid." Applicant's Remarks, p. 3, lines 9-12.

The limitation under discussion follows.

Claim 19 . . .

the filtration system further comprising a filter cleaning apparatus configured to project a cleaning liquid supplied by a separate dedicated pump onto a downstream side of the filter to dislodge particulates trapped on an upstream side thereof, the filter cleaning apparatus comprising a rotatable member rotatably mounted on a tubular member having at least one side-opening configured to supply cleaning liquid to said rotatable member . . .

The examiner responds as in the patentability analysis. As shown in Table 1 above, Hansen et al. discloses the claimed invention including a fluid cleaning apparatus shown in Figs. 1-3 that has a purge valve used to clean the filter. The purge valve has a rotatable member (turbine 142) mounted on a tubular member (center of turbine 142) with at least one side-opening (nozzle 141) to supply cleaning liquid (fluid) to the rotatable member (turbine 142). Regarding the separate dedicated pump for the cleaning liquid, Hansen et al. teaches this as part of the source of regeneration solution 15, shown in Fig. 1.

To recap, Hansen et al. discloses the claimed invention, but teaches projecting cleaning liquid on to the rotatable member to clean the filter, instead of projecting cleaning liquid on to the downstream side of the filter to clean the filter. In Figs. 1 and 10, Racine teaches the recited filter cleaning apparatus in the form of piston 48. Racine further teaches that the filter cleaning apparatus provides a “self-cleaning filter . . . for filtering incoming dirty liquid and distinctly recuperating clean liquid and waste liquid.” Racine, Abstract, lines 1-3. Specifically, in Fig. 10, Racine teaches that the filter cleaning apparatus has a rotatable member (main body 66) mounted to a tubular member (plunger 72). There is at least one side-opening to supply cleaning liquid to the rotatable member (main body 66) as indicated by the flow lines. There is a gap between the tubular member (at rod 72c of plunger 72) and the rotatable member (main body 66). The gap allows cleaning fluid to escape and maintain the bearing surfaces free of particulates, as indicated by the flow lines.

Racine further provides motivation to have constructed the Hansen et al. filtration system with the recited filter cleaning apparatus when Racine states in the Abstract,

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lines 1-3, that such a modification would provide a “self-cleaning filter . . . for filtering incoming dirty liquid and distinctly recuperating clean liquid and waste liquid.”

- b. Regarding amended claim 19, applicant argues, “[T]he claimed invention requires that a gap is provided between the tubular member and the rotatable member configured to allow cleaning fluid to escape and maintain the bearing surfaces free of particulates.” Applicant’s Remarks, p. 3, lines 4-6. Applicant continues, “[T]he skilled person is taught directly away from modifying the arrangement of Racine to arrive at the claimed invention whereby a gap is maintained to allow cleaning fluid to escape,” because, “Racine discloses an arrangement whereby the plunger 72 forms a seal with the piston 48' to prevent the cleaning fluid escaping. If this seal was not maintained, the pressure differential across the piston 48' would be reduced and the piston 48' would cease to reciprocate within the screen 14. Thus, the piston 48' would not function and the screen 14 would not be cleaned.” Applicant’s Remarks, p. 3, lines 18-23.

The limitation under discussion follows.

Claim 19 . . .

wherein a gap is provided between the tubular member and the rotatable member configured to allow cleaning fluid to escape and maintain the bearing surfaces free of particulates.

The examiner responds as in the above patentability analysis. In Fig. 10, Racine teaches that the filter cleaning apparatus has a rotatable member (main body 66) mounted

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to a tubular member (plunger 72). There is a gap between the tubular member (at rod 72c of plunger 72) and the rotatable member (main body 66). The gap allows cleaning fluid to escape and maintain the bearing surfaces free of particulates, as indicated by the flow lines. Racine further provides motivation to have constructed the Hansen et al. filtration system with the filter cleaning apparatus, and its recited gap, when Racine states in the Abstract, lines 1-3, that such a modification would provide a “self-cleaning filter . . . for filtering incoming dirty liquid and distinctly recuperating clean liquid and waste liquid.”

Conclusion

44. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

45. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

46. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

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47. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

48. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DRA/

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797